

REMARKS

By the present Amendment, claims 1-10 are cancelled and claims 11-23 are added. This leaves claims 11-23 pending in the application, with claim 11 being independent.

Substitute Specification

The specification is revised to eliminate grammatical and idiomatic errors in the originally presented specification. The number and nature of the changes made in the specification would render it difficult to consider the case and to arrange the papers for printing or copying. Thus, the substitute specification will facilitate processing of the application. The substitute specification includes no "new matter". Pursuant to M.P.E.P. § 608.01(q), voluntarily filed, substitute specifications under these circumstances should normally be accepted. A marked-up copy of the original specification is appended hereto.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Original claims 1-10 appear to stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. By the present Amendment, the originally filed claims are rewritten to avoid the language alleged to be indefinite in the Office Action. All language of the presently pending claims is now believed to be clear and definite.

Thus, the pending claims are definite and comply with 35 U.S.C. § 112.

Rejection Under 35 U.S.C. §102 and §103

Claim 11 covers a pressure accumulator for dampening pulses comprising an accumulator housing 10 having a gas space 26 and a fluid space 40 therein, a piston part 28 located and movable in the housing, and a bellows-shaped separating element 30 supported at one end 32 on

the piston part and at an opposite end 34 on the housing and separating the gas space and the fluid space in the housing with the piston part in a fluid-tight and a gas-tight manner. A definable volumetric portion of a working gas and a liquid fill gas space 26. The liquid in the gas space is an alcohol.

By forming the pressure accumulator in this manner, the accumulator can be made small while providing effective dampening and smoothing of pulsations in the fluid medium in and connected to fluid space 40. The liquid alcohol in the gas space reduces the volume of the gas in that space. Additionally, expansion and contraction of the fold parts are supported on and facilitated by the liquid alcohol in the gas space, increasing surface life and operating reliability of the pressure accumulator, particularly for rapid pulsations and high-speed pressure surges. This claimed structure is not disclosed or rendered obvious by any of the cited patents.

Claim 1 stands rejected under 35 U.S.C. §103 as being anticipated by U.S. Patent No. DE 199 08 089 to Herold (cited and applied in the International Search Report). Although no comments are provided, presumably, the comments in the International Search Report are being applied.

Original claim 1 also stands rejected under 35 U.S.C. §103, along with dependent claims 2-10, as being unpatentable over U.S. Patent No. 4,997,009 to Niikura in view of U.S. Patent No. 3,933,172 to Allen. The Niikura patent is cited for a pressure accumulator/pulsation dampener having a housing 15, a piston 35, a bellows 17 and gas and liquid chambers that are sealed. Ports 21 and 22 are alleged to provide fluid connections in the Niikura accumulator. The Niikura accumulator allegedly has a channel formed around the piston between the piston and the wall capable of holding fluid, with the piston being movably guided in the housing for a distance into

one end of the housing viewed as a cap. Niikura guide cap 55 is alleged to provide a stop preventing contact of the piston with an inside wall 36 of the accumulator where it is attached to a cover part of the housing. The Niikura bellows is allegedly of metal with a plurality of folds. The Niikura ports 21 and 22 are allegedly connected to an antechamber inside inner cylinder 16. In the Niikura accumulator, an annular gap is allegedly provided between the gas chamber and the bellows members. The Allen patent is cited for disclosing an accumulator structure having a bladder, an ethylene glycol in a space 46 to prevent gas from mixing with the oil in the chamber thereby forming a barrier (column 3, line 50). In support of the rejection, it is alleged that it would be obvious to use the Allen ethylene glycol barrier between the gas and oil chambers of the Niikura accumulator.

The German Herold patent has a gas chamber 23. However, the German Herold accumulator is not shown or alleged to have a liquid in that gas chamber, and particularly does not disclose the use of an alcohol liquid in that chamber.

The Niikura patent discloses a gas chamber 45. However, nothing in the rejection demonstrates that the Niikura gas chamber has a liquid therein, particularly, an alcohol liquid, as claimed.

The Allen patent is cited as disclosing an accumulator having a gas contained in an elastomer bag or bladder 44, crude oil 58 in a barrier tank 56 and a liquid 46 forming an isolating barrier between the crude oil 58 and the elastomer bladder 44 of the accumulator vessel. The barrier liquid 46 is disclosed as being ethylene glycol or some other liquid heavier than crude oil 58.

However, the Allen ethylene glycol liquid 46 is not within the gas space defined by the interior of bladder 44. Thus, the Allen patent, considered alone or in combination with the Niikura patent, would not disclose or render obvious to one of ordinary skill in the art the provision of an alcohol liquid within a gas space, such as the gas chamber 45 of the Niikura patent. Any obvious combination, if any exists at all, of the Niikura and Allen patents would be the provision of the ethylene glycol within the fluid or liquid chamber 41 of the Niikura communication between the inside of bellows 31 and the pump and/or hydraulic device 12.

Accordingly, claim 11 is patentably distinguishable over the cited patents by the liquid alcohol in the gas space, a feature not disclosed by any of the cited patent documents.

Claims 12-23, being dependent upon claim 11, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents.

Claim 12 is further distinguishable by the alcohol liquid in the gas space being ethylene glycol. No such liquid is located in the gas chamber in any of the cited patents.

Claim 13 is further distinguishable by the fluid connections, in combination with the liquid alcohol in the gas space.

Claim 14 is further distinguishable by the supply of diesel fuel or heavy oil to the fluid space, in combination with the liquid alcohol in the gas space.

Claim 15 is further distinguishable by the piston cavity in combination with the liquid alcohol in the gas space.

Claim 16 is further distinguishable by the guiding of the piston part in combination with the liquid alcohol in the gas space.

Claim 17 is further distinguishable by the radial distance between the cover part portions of the housing and the piston part for flow of the liquid alcohol.

Claim 18 is further distinguishable by the stop on the piston, particularly in combination with the liquid alcohol in the gas space.

Claim 19 is further distinguishable by the stop surface on the end opposite the stop, particularly in combination with the liquid alcohol in the gas space.

Claim 20 is further distinguishable by the stop surface engaging a cover part, particularly in combination with the liquid alcohol in the gas space.


Claim 21 is further distinguishable by the metal bellows that can receive the liquid alcohol in the gas space.

Claim 22 is further distinguishable by the common antechamber within the piping, particularly in combination with the liquid alcohol in the gas space.

Claim 23 is further distinguishable by the annular gap that conveys the working gas and liquid flow to an inside surface of the separating element.

In view of the foregoing, claims 11-23 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,



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